US Pat Appln Nr 10/043,284 Docket 630-24US (CIP)

Amendments to CLAIMS,
as submitted in response to O/A dated 03 June 2003

Claim 1 (previously cancelled).

CLAIM 2 (now amended). Procedure for attaching a headrest-tube to an elongate seatframe-piece of an automobile seat having an upper side and a lower side, including:

[02] providing a through-hole in the seatframe-piece, through from the upper side to the lower side, for receiving the headrest-tube;

[03] making a sub-assembly of the headrest-tube in the through-hole, wherein the headrest-tube has an upper portion, which lies above the seatframe-piece, and a lower portion, which lies below the seatframe-piece;

[04] providing a die-set, which includes an upper punch and a lower punch, and arranging the sub-assembly in the die-set, with the headrest-tube vertical;

[05] providing the headrest-tube with an upper shoulder, which lies in contact with the upper side of the seatframe-piece over an upper annular margin of that upper side, being a margin surrounding the through-hole;

[06] pressing the headrest-tube vertically, in the die-set, with a lower-tube-collapsing-force;

[07] applying the lower-tube-collapsing-force in such manner as to collapse the lower portion of the headrest-tube, and thereby to expand the lower portion diametrally, at least over a region of the lower portion of the headrest-tube adjacent to the lower side of the seatframe-piece, thereby forming a lower shoulder of the headrest-tube;

[08] wherein the lower shoulder lies in contact with the lower side of the seatframe-piece, over a lower annular margin of the lower side of the seatframe-piece, surrounding the through-hole;

~~[pressing the headrest-tube vertically with a tube-coining-force;]~~

~~[applying the tube-coining-force between the upper and lower shoulders;]~~

[09] the seatframe-piece being sandwiched between the upper and lower shoulders, then pressing the upper and lower shoulders together with a shoulder-coining-force;

[10] so arranging the die-set that the upper and lower punches do not bottom together while the shoulder-coining-force is being applied, thereby enabling the force of the press to be available as the shoulder-coining-force;

[11] ~~[wherein]~~ applying the ~~[tube]~~shoulder-coining-force ~~[is of]~~ at sufficient magnitude to coin the upper and lower shoulders together, onto the two sides of the seatframe-piece, whereby the seatframe-piece becomes gripped between the upper and lower shoulders of the headrest-tube;

[12] wherein the [~~tube~~]shoulder-coining-force is much larger than the lower-tube-collapsing-force;

[13] and then taking the sub-assembly out of the die-set.

Claim 3 (original) Procedure of claim 2, including providing the upper shoulder as an upper ring-bead.

Claim 4 (original). Procedure of claim 3, wherein the upper ring-bead was pre-formed on the headrest-tube, prior to the headrest tube being inserted into the through-hole.

Claim 5 (original). Procedure of claim 3, including:

[02] providing the lower shoulder as a lower ring-bead;

[03] forming the upper ring-bead in the headrest-tube after the headrest-tube has been inserted into the through-hole, and before forming the lower ring-bead in the headrest-tube.

Claim 6 (original). Procedure of claim 5, including:

[02] providing an annular nose on the lower punch, to confine the lower portion of the headrest-tube against diametral expansion;

[03] positioning the annular nose against the lower annular margin of the seatframe-piece while pressing the upper portion of the headrest-tube with an upper-tube-collapsing-force.

Claim 7 (now amended). Procedure of claim 2, including:

[02] the headrest-tube having a lower end-abutment, which is spaced vertically along the headrest-tube away from the [~~second~~] lower shoulder;

[03] arranging the upper punch and lower punch to apply the lower-tube-collapsing-force to the headrest-tube between the lower end-abutment and the upper shoulder;

[04] arranging the upper punch and lower punch to apply the [~~tube~~]shoulder-coining-force to the headrest-tube between the upper shoulder and the lower shoulder.

Claim 8 (now amended). Procedure of claim 2, including:

[02] forming the upper and lower shoulders as upper and lower ring-beads, after the headrest-tube has been inserted into the through-hole, in the following sequence:

[03] providing the lower punch with a lower annular-nose, which confines a lower portion of the headrest-tube against diametral expansion;

[04] arranging the die-set so the nose contacts against the lower annular margin;

[05] applying an upper-tube-collapsing-force between an upper end-abutment of the

headrest-tube and the lower annular-nose, whereby the upper portion of the headrest-tube collapses vertically and expands diametrally, and forms the upper ring-bead;

[06] then withdrawing the lower annular-nose, whereby now the lower portion of the headrest tube can expand;

[07] then applying the lower-tube-collapsing-force between the lower end-abutment and the just-formed upper ring-bead, whereby the lower portion collapses and expands, and forms the lower ring-bead;

[08] then arranging the die-set to apply the [~~tube~~]shoulder-coining-force, now in the form of a ring-bead-coining-force, between the upper and lower ring-beads.

Claim 9 (now amended). Procedure of claim 8, including so arranging the die-set that the upper and lower punches do not touch directly against the seatframe-piece, when applying the upper-tube-collapsing-force, nor when applying the [~~tube~~]ring-bead-coining-force.

Claim 10 (now amended). Procedure of claim 2, including:

[02] providing the upper shoulder as an upper ring-bead, and the lower shoulder as a lower ring-bead;

[03] so arranging the die-set as to form the upper and lower shoulders [~~simultaneously~~] in the same press stroke.

Claim 11 (original). Procedure of claim 2, wherein:

[02] the seatframe-piece is in the form of a flanged section, having a web, and having a flange alongside, and contiguous with, the web;

[03] the said through-hole comprises a hole through the web;

[04] the flanged form is characterised in that the flange protrudes with respect to the web in the vertical direction, on at least one of the sides of the seatframe-piece;

[05] the seatframe-piece has the flanged section over at least a flange-portion of the seatframe-piece, being a portion that includes the annular margin.

Claim 12 (original). Procedure of claim 2, wherein:

[02] the seatframe-piece is in the form of an I-beam section, having a web, and having flanges to left and right of, and contiguous with, the web;

[03] the said through-hole comprises a hole through the web;

[04] the I-beam form is characterised in that the left and right flanges protrude with respect to the web in the vertical direction, on both the upper side and lower side of the seatframe-piece;

[05] the seatframe-piece has the I-beam section over at least a portion of the seatframe piece that includes the annular margin.

Claim 13 (now cancelled).

CLAIM 14 (new). Procedure for attaching a headrest-tube to an elongate seatframe-piece of an automobile seat having an upper side and a lower side, including:

[02] providing a through-hole in the seatframe-piece, through from the upper side to the lower side, for receiving the headrest-tube;

[03] making a sub-assembly of the headrest-tube in the through-hole, wherein the headrest-tube has an upper portion, which lies above the seatframe-piece, and a lower portion, which lies below the seatframe-piece;

[04] providing a die-set, which includes an upper punch and a lower punch, and arranging the sub-assembly in the die-set, with the headrest-tube vertical;

[05] providing the headrest-tube with an upper ring-bead, which lies in contact with the upper side of the seatframe-piece over an upper annular margin of that upper side, being a margin surrounding the through-hole;

[06] pressing the headrest-tube vertically, in the die-set, with a lower-tube-collapsing-force;

[07] applying the lower-tube-collapsing-force in such manner as to collapse the lower-portion of the headrest-tube, and thereby to expand the lower-portion diametrally, at least over a region of the lower-portion of the headrest-tube adjacent to the lower side of the seatframe-piece, thereby forming a lower ring-bead of the headrest-tube;

[08] wherein the lower ring-bead lies in contact with the lower side of the seatframe-piece, over a lower annular margin of the lower side of the seatframe-piece, surrounding the through-hole;

[09] the seatframe-piece being sandwiched between the upper and lower ring-beads, then pressing the upper and lower ring-beads together with a ring-bead-coining-force;

[10] so arranging the die-set that the upper and lower punches do not bottom together while the ring-bead-coining-force is being applied, thereby enabling the force of the press to be available as the ring-bead-coining-force;

[11] applying the ring-bead-coining-force at sufficient magnitude to coin the upper and lower ring-beads together, onto the two sides of the seatframe-piece, whereby the seatframe-piece becomes gripped between the upper and lower ring-beads of the headrest-tube;

[12] wherein the ring-bead-coining-force is much larger than the lower-tube-collapsing-force;

[13] and then taking the sub-assembly out of the die-set.

Claim 15 (new). Procedure of claim 14, wherein the upper ring-bead is pre-formed, being

formed before being assembled into the through-hole in the seatframe-piece.

Claim 16 (new). Procedure of claim 14, including forming the upper ring-bead on a first press stroke, and the lower ring-bead on a second press stroke.

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Claim 17 (new). Procedure of claim 14, including forming both the upper ring-bead and the lower ring-bead on the same press stroke.
